DUMMY MODULE ASSEMBLY

CURRENT PROGRESS AT ARGONNE

01

The Mission

Our job at Argonne is to assemble and test pixel detector modules.

Currently we are using dummy detectors for practice assembly, but later we will receive real components.

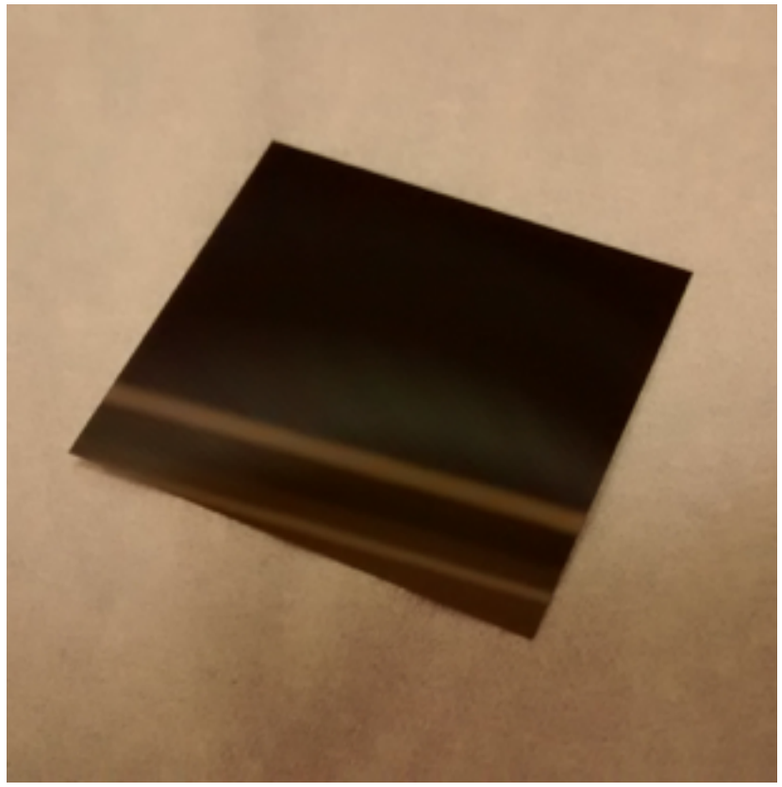
This document describes how we assembled the first modules.

We assemble four front-end chips, one silicon detector, and a flex cable with epoxy in order to create a single dummy module.

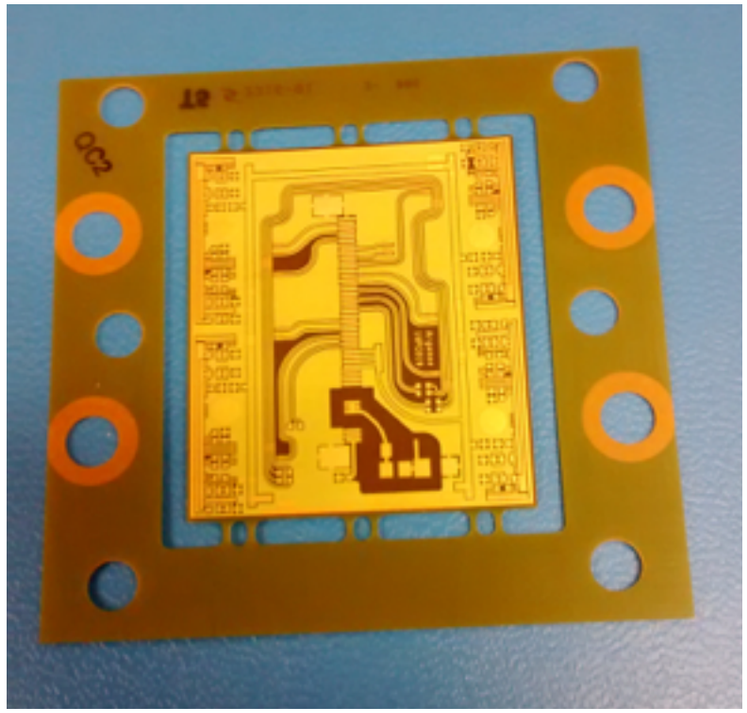
02

The Pieces

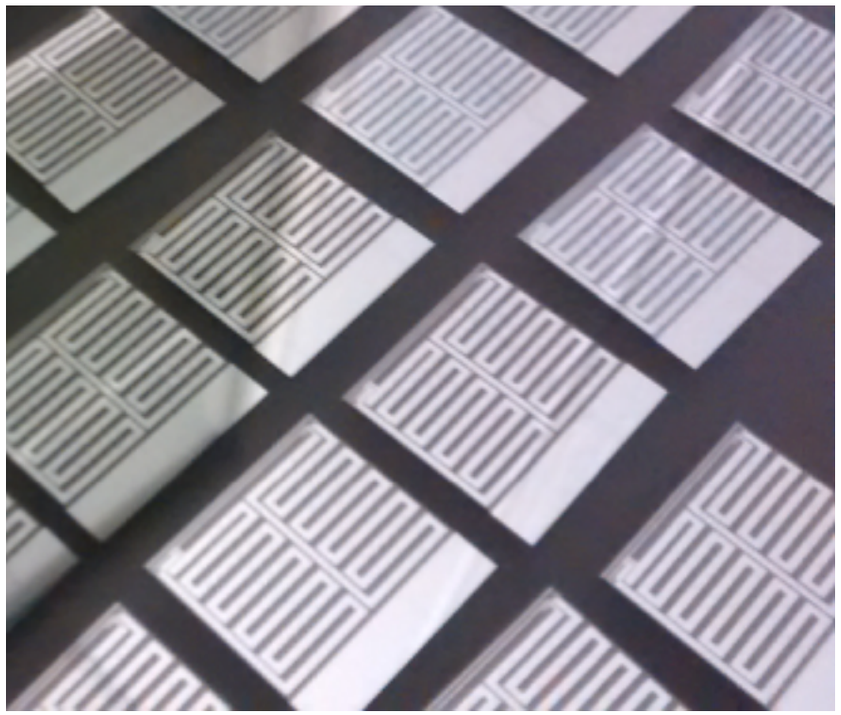
silicon detector



flex cable

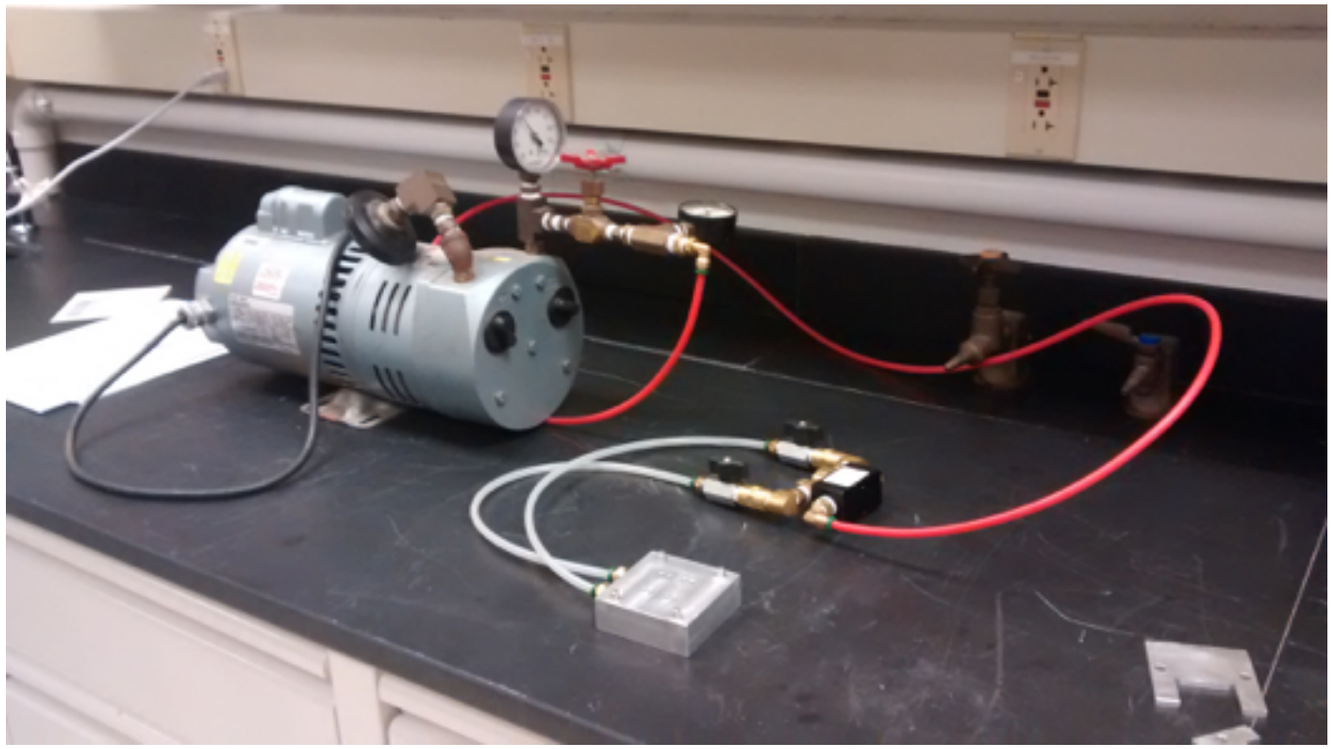


front-end chips

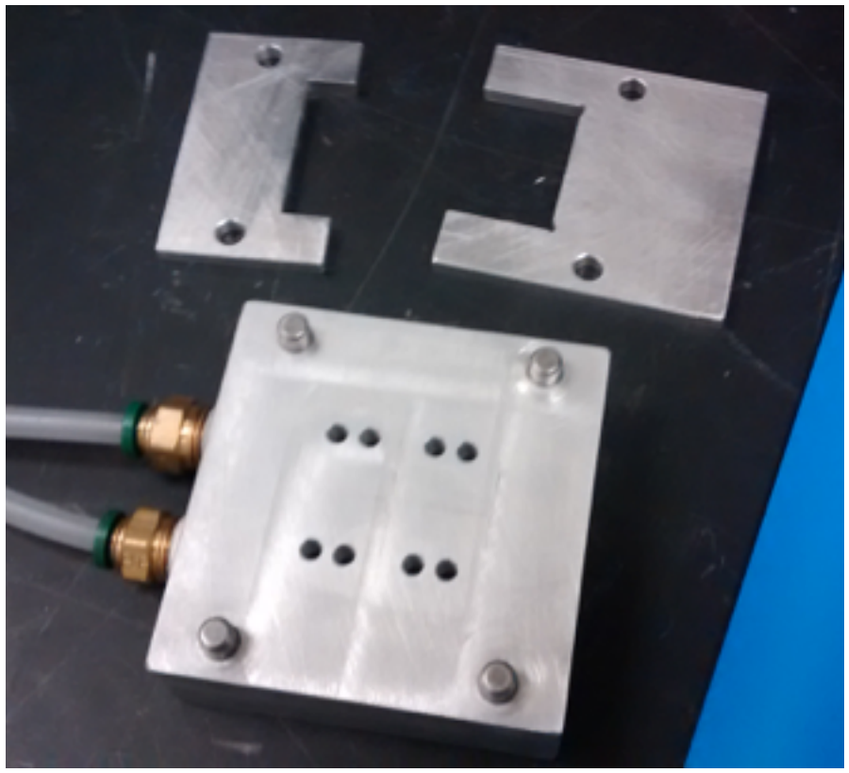


epoxy tape

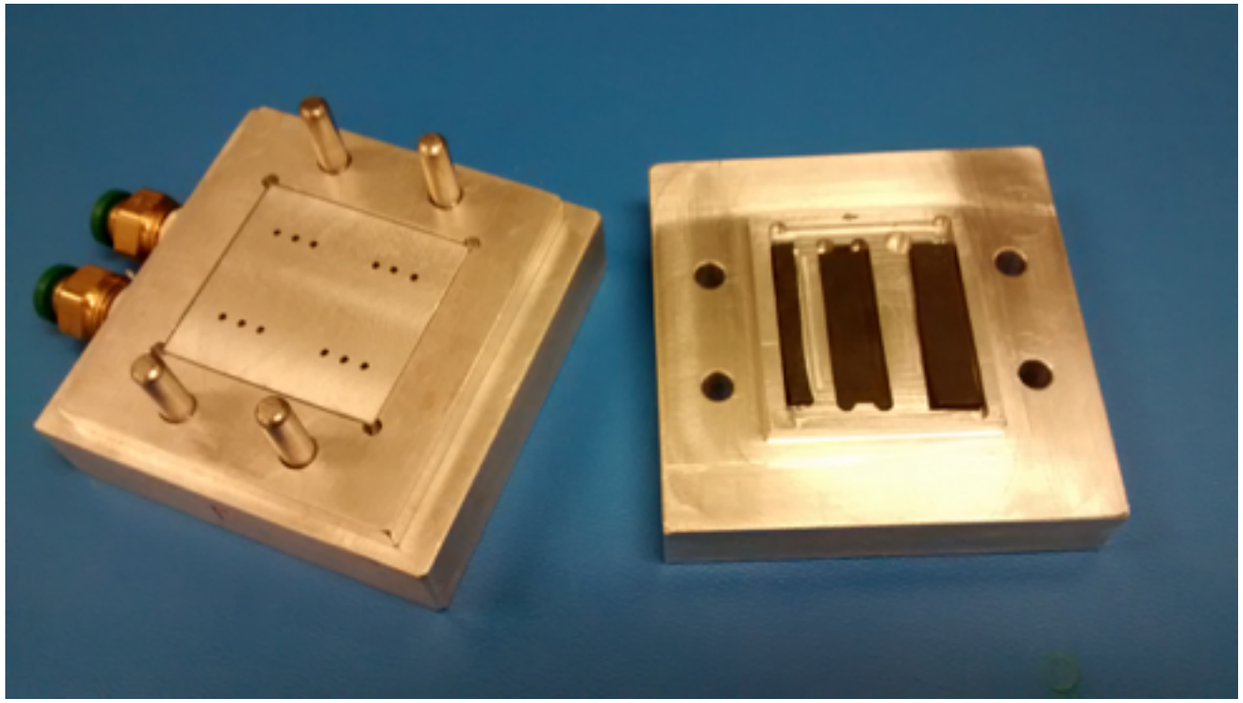
vacuum



module jig



cable jig

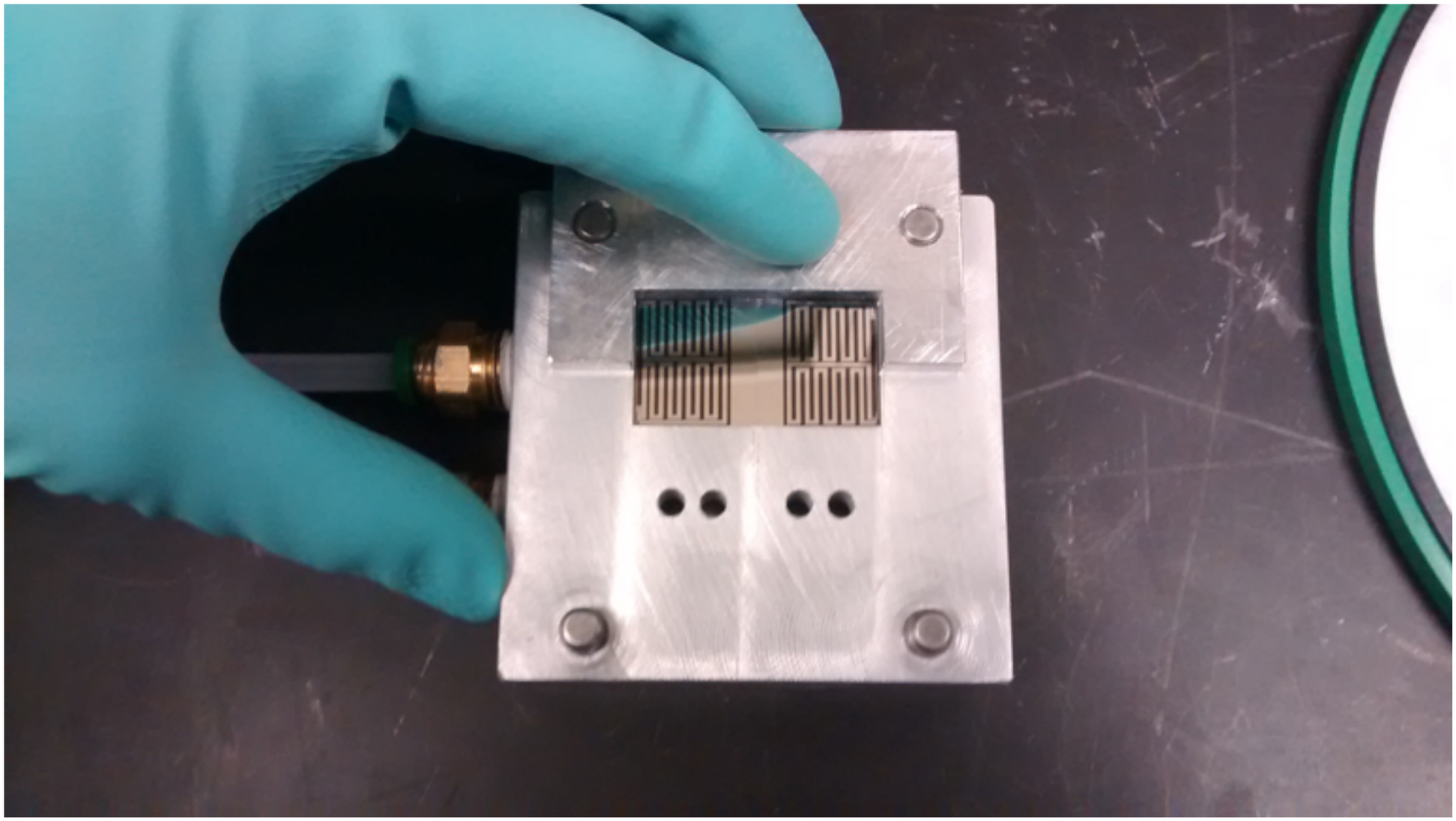


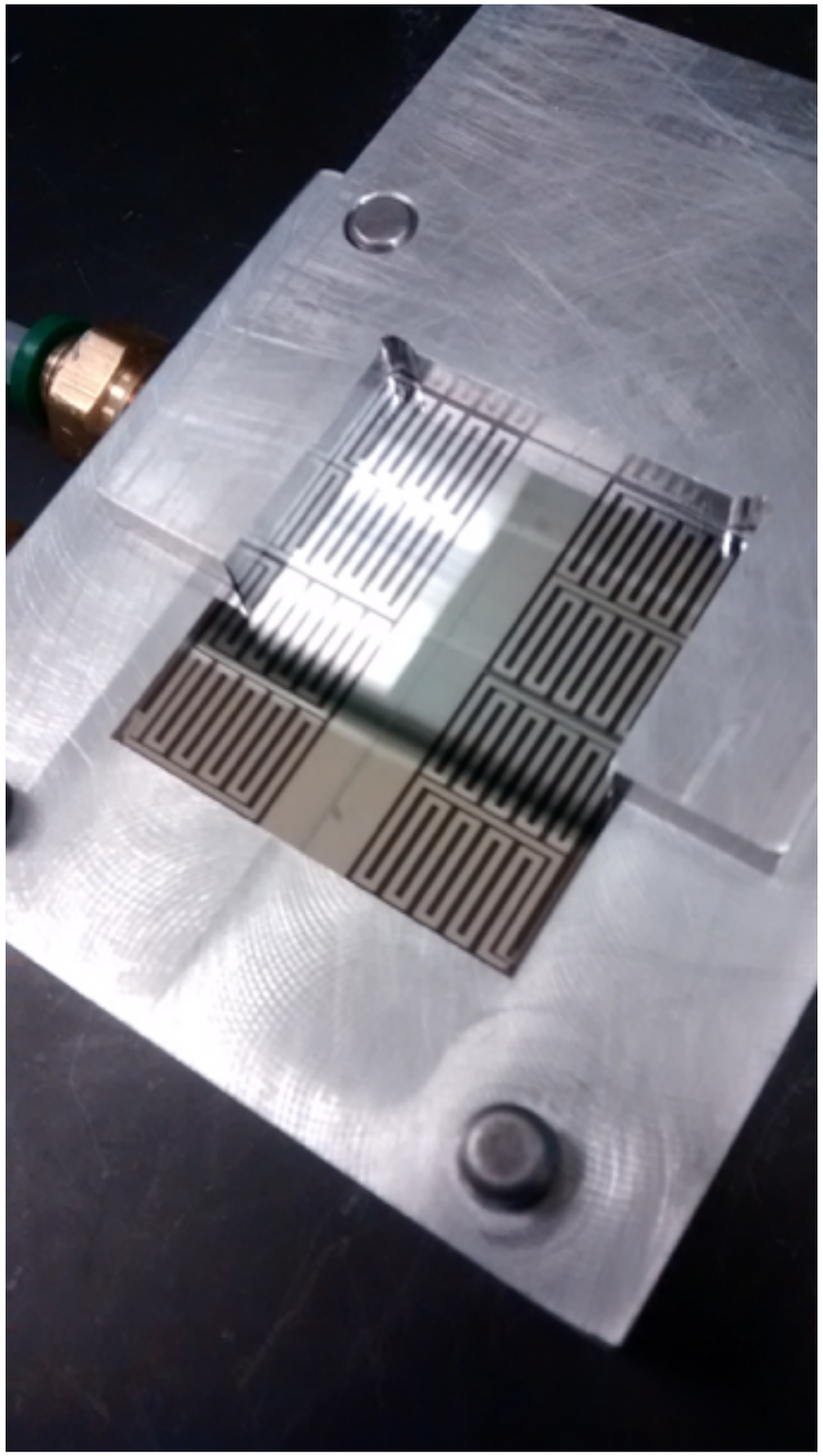
03

Module Assembly

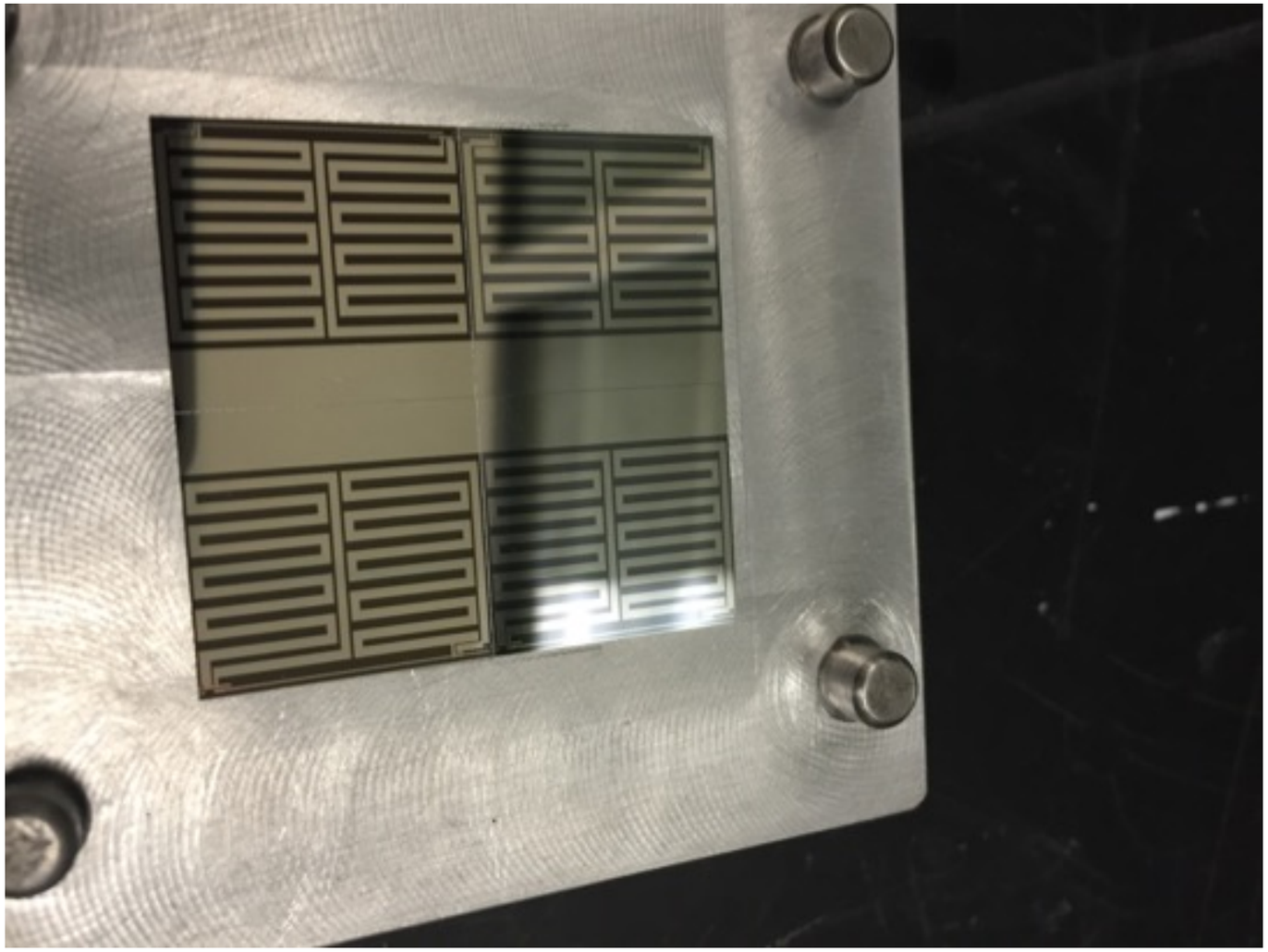
First we connect the silicon detector to the front-end chips. The alignment must be precise, in order to ensure accuracy during wire bonding.

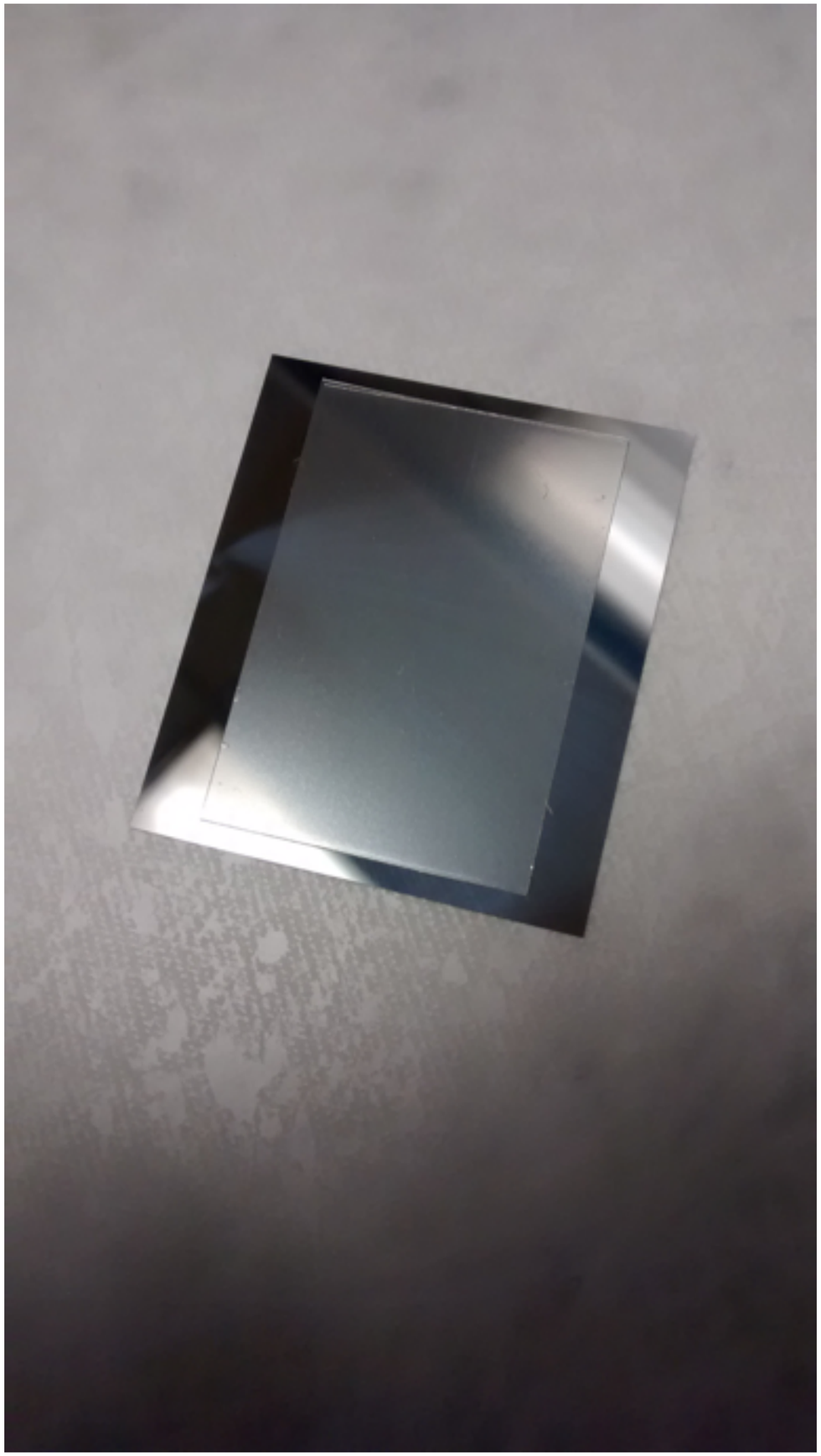
First we use a jig to align two front-end chips. A vacuum is applied to hold the chips in place.



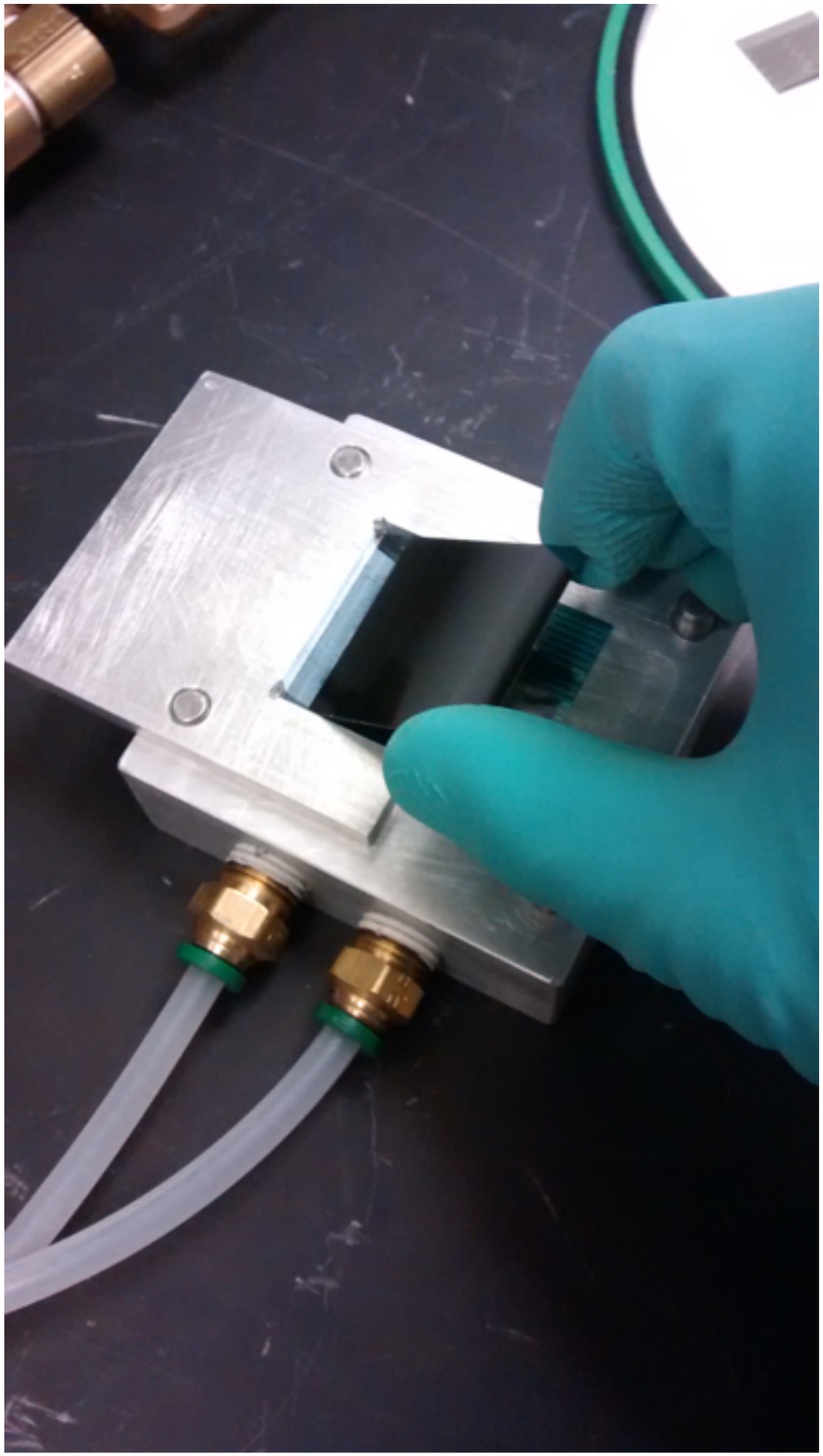


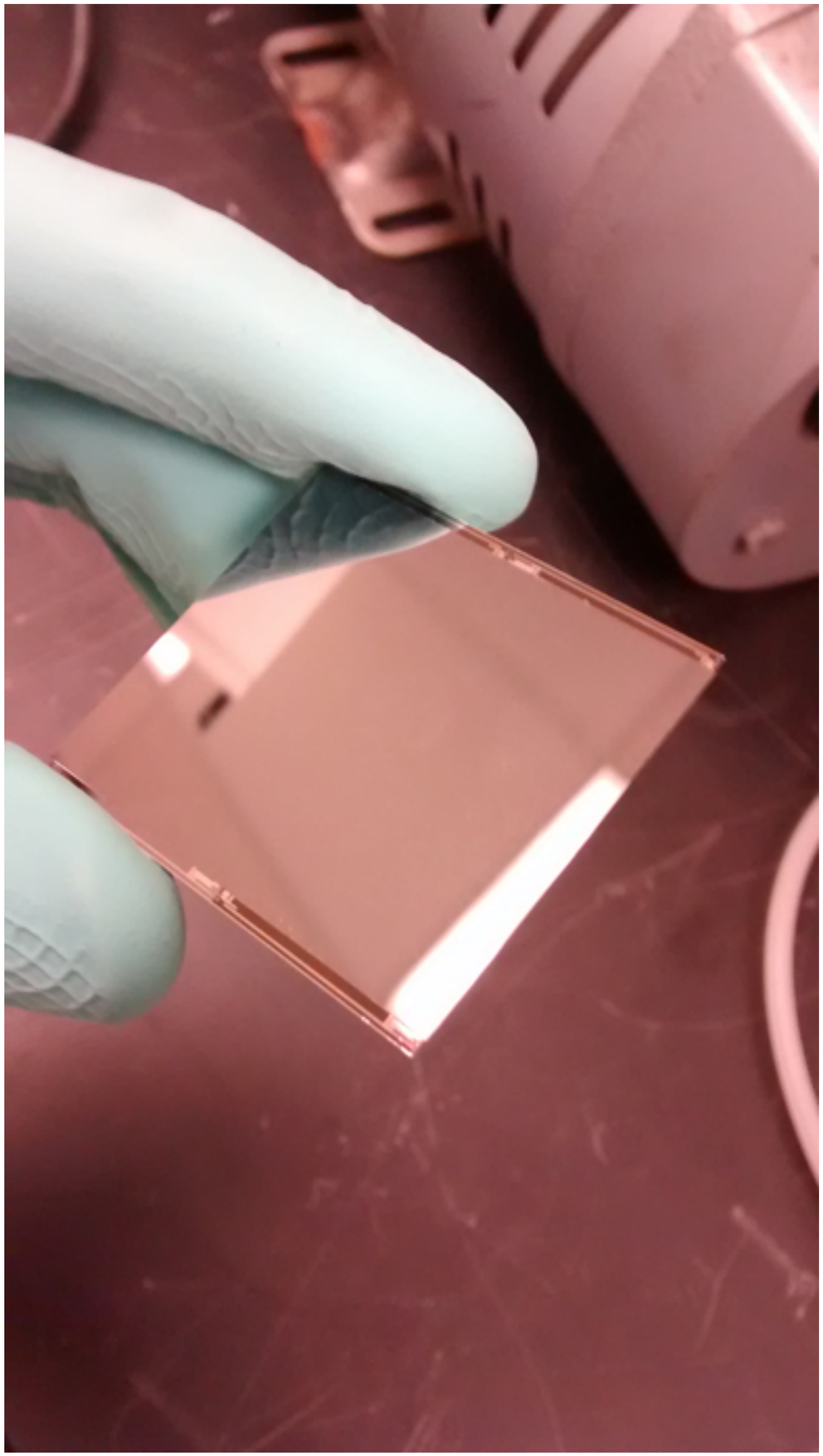
This is repeated on
the other side.





Now double-sided epoxy tape is stuck to the silicon detector. One end of the tape is exposed and set on the detector as so. Then the other side is exposed, so that the detector may be attached to the front-end chips.



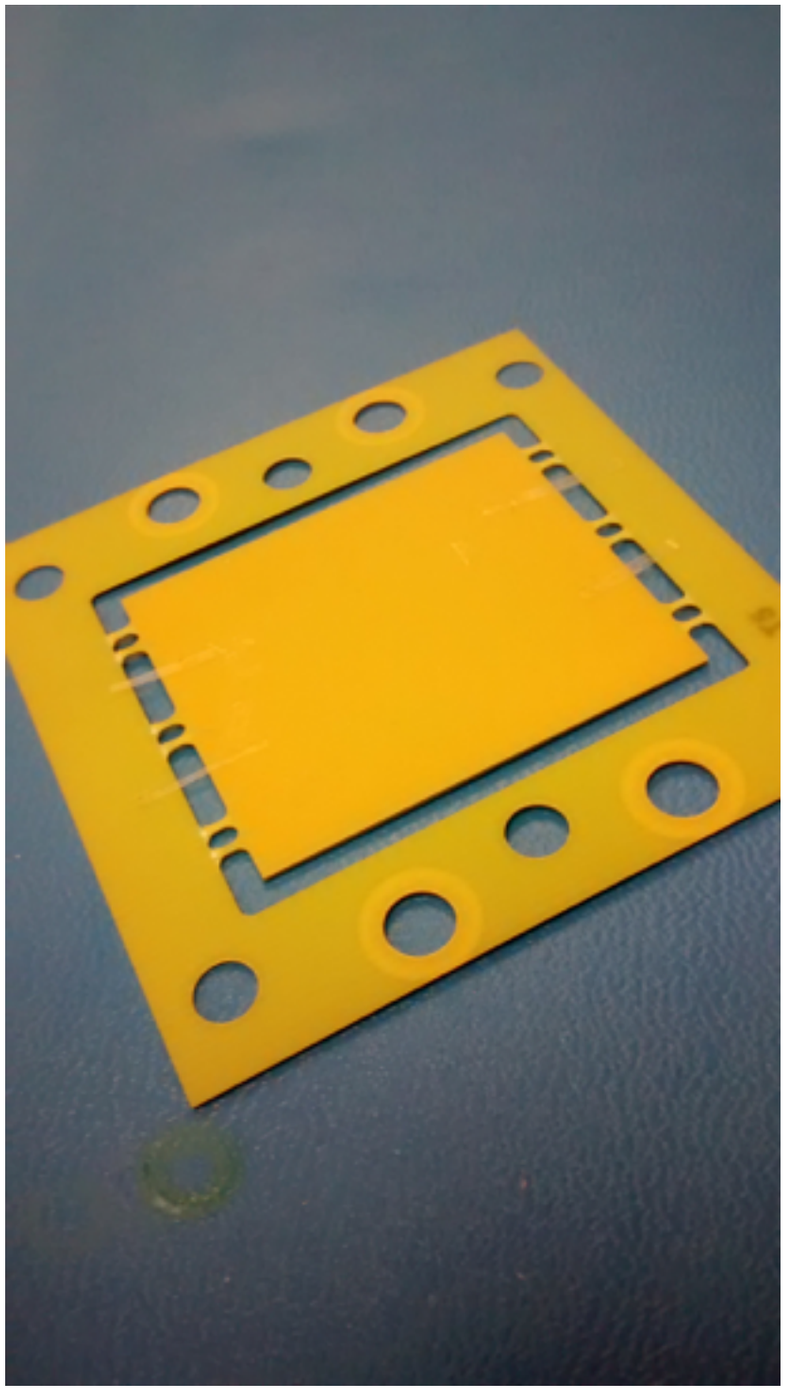


SILICON ALIGNMENT WITH A SECOND JIG PIECE

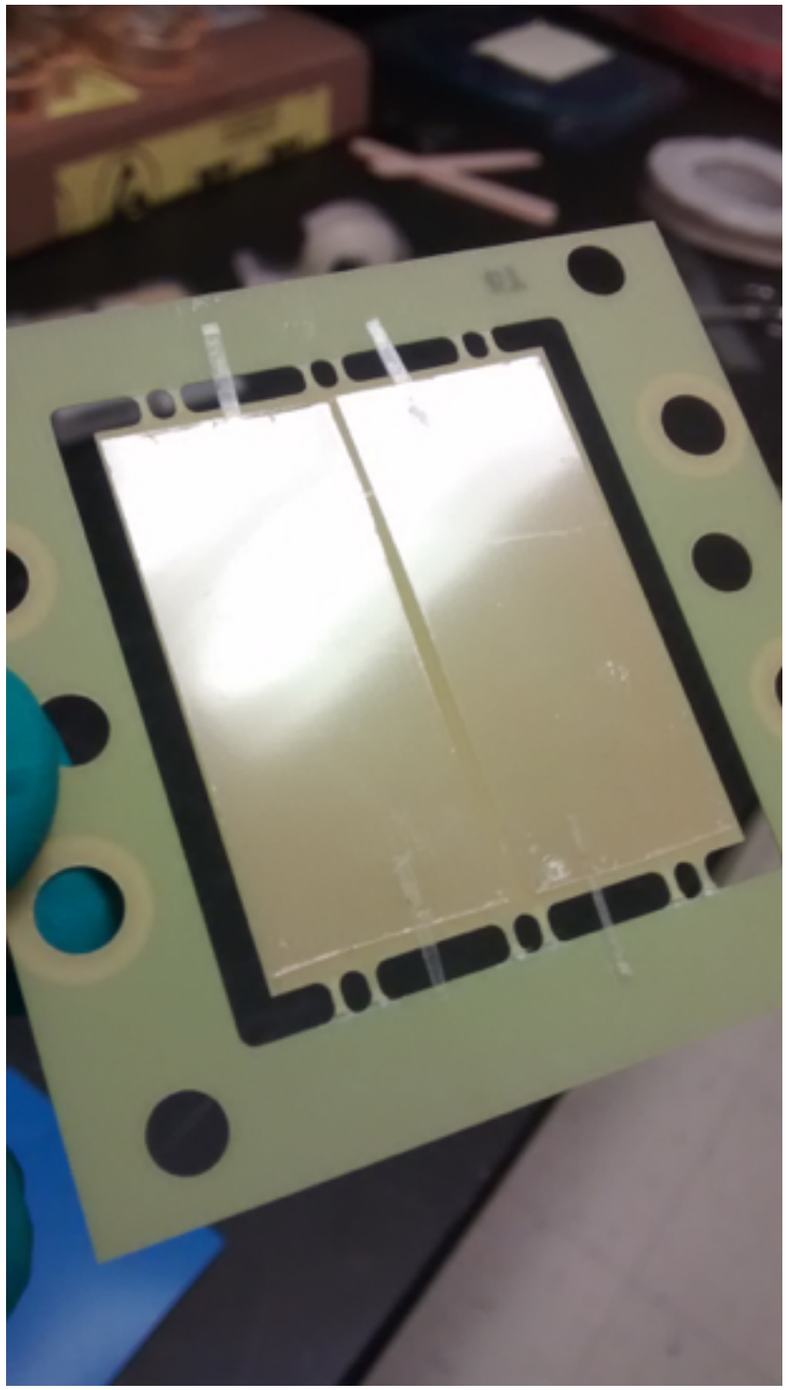
Next we attach the flex cable on top of the front-end chips. Once again we use epoxy tape.

04

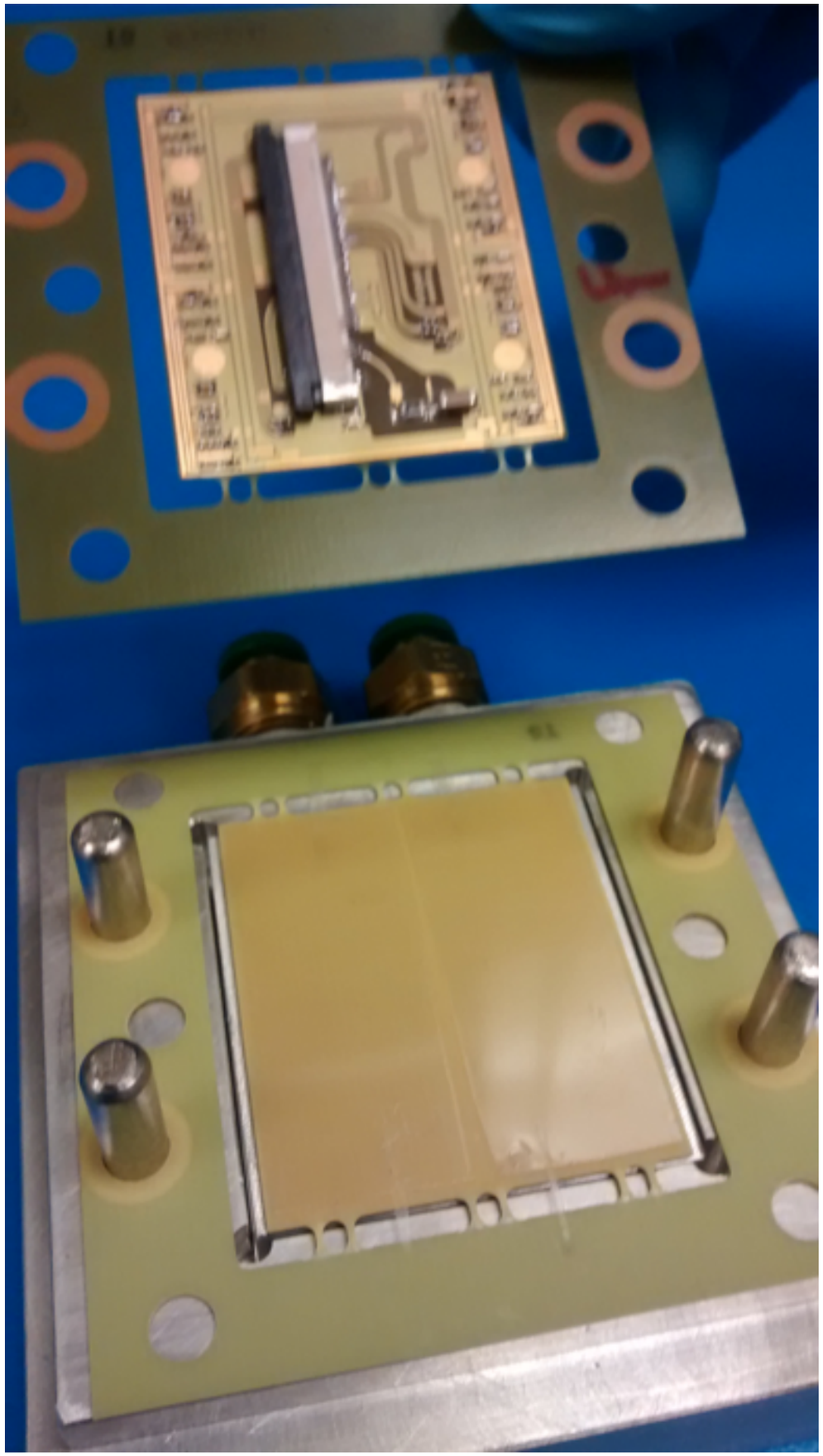
Flex Cable Attachment



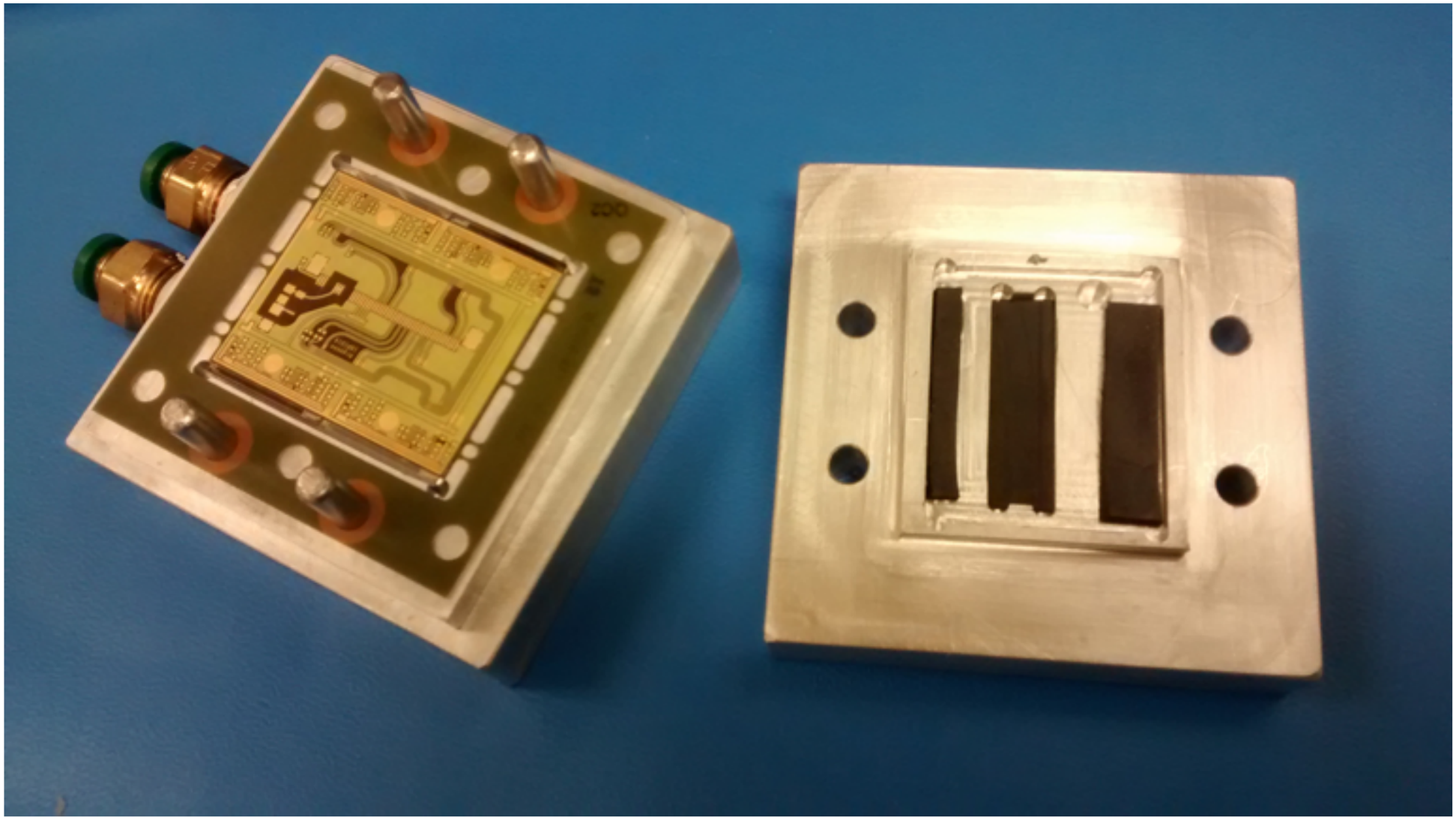
To attach epoxy tape to the flex cable, first we cut tape to size and use double-sided scotch tape to hold it onto a secondary flex cable. The epoxy is not exposed at this point.

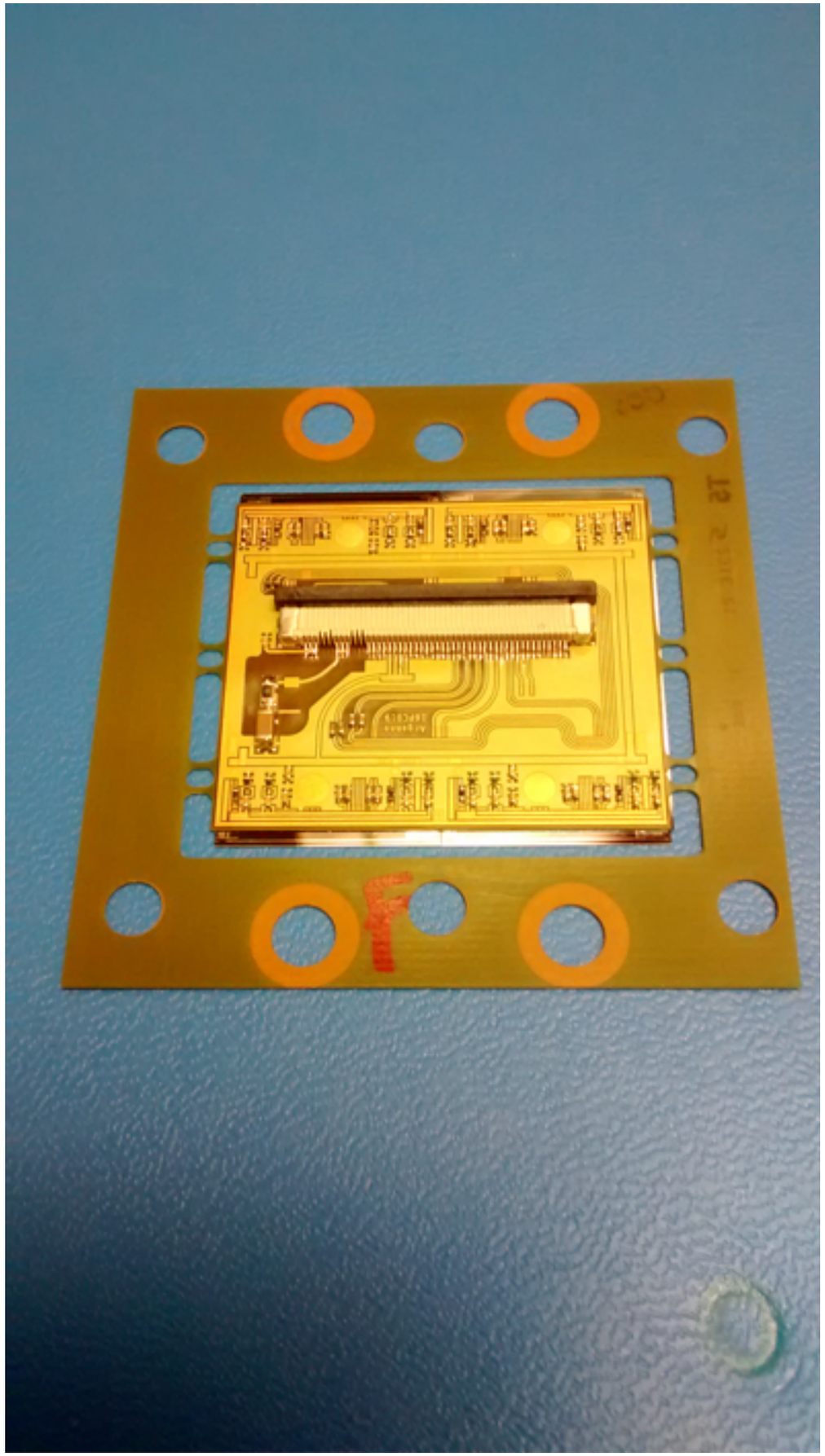


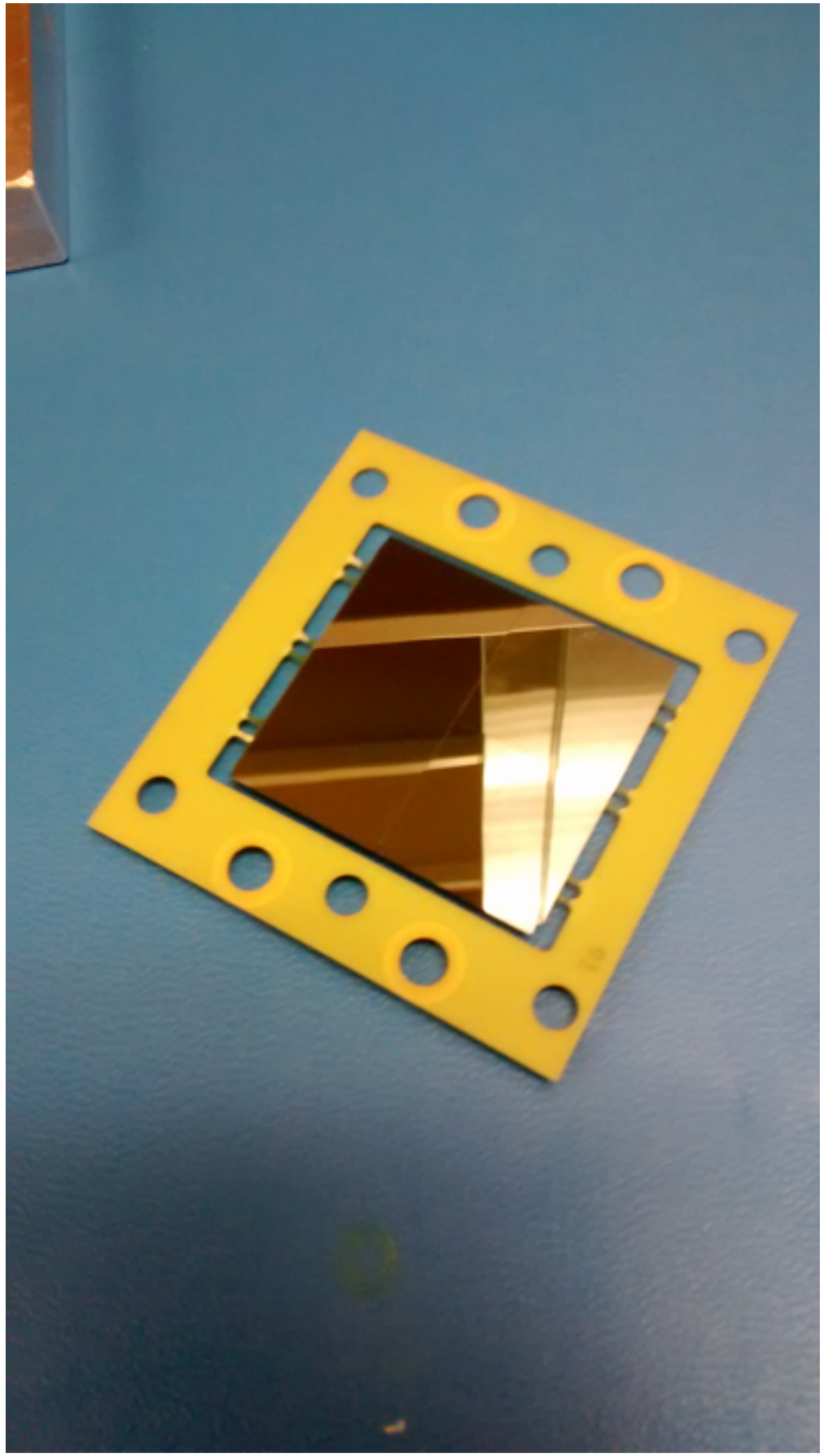
The top side of the epoxy tape is exposed. Then, using a jig, we transfer the epoxy from one flex cable to another. This ensures that the tape sits well on the cable, and is able to come all the way to the edge on the sides with bond pads.



Using a flex cable jig, the cable is then attached to the detector module.







05

Next Steps

The assembly is now ready for wire bonding, which we will do using machinery at Fermilab.

After this we can create a dummy module using real front-end chips, and perform electronic testing on the completed pixel modules.

For use in mechanical stave mockups, we can attach a small connector to our flex cables.